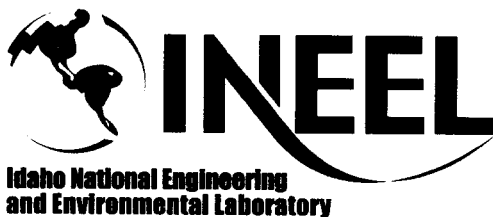


# Specification

PROJECT FILE NO. 021052

## **Backhoe Modifications – Preparation for Boot Installation and Field Use for the OU 7-10 Glovebox Excavator Method Project**

Prepared for:  
U.S. Department of Energy  
Idaho Operations Office  
Idaho Falls, Idaho



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Rev. 03

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## ACRONYMS

BES	Backhoe Excavation System
CAT	Caterpillar Incorporated
INEEL	Idaho National Engineering and Environmental Laboratory
NFPA	ANSI/National Fire Protection Association
OSHA	Occupational Safety and Health Administration
OU	Operational Unit
RCS	Retrieval Confinement Structure

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## 1. SUMMARY

### 1.1 General

The Idaho National Engineering and Environmental Laboratory (INEEL) will procure a Backhoe Excavation System (BES). The BES incorporates a modified Caterpillar (CAT) 446B backhoe loader and associated end effectors. The backhoe loader will be the primary instrument used in the retrieval of radioactively contaminated waste in a Glovebox Excavator Method Project.

A standard 446B backhoe performs waste excavation and core sampling. The backhoe cab and loader are located outside a Retrieval Confinement Structure (RCS), while the boom, stick, and various end effectors are located inside the contaminated part of the RCS structure. The backhoe is sealed to the RCS through the use of an internal and external backhoe boot configuration mounted directly to the backhoe (see Figure 1).

Because of the solid frame structure of the CAT 446B backhoe, the sides and bottom of the frame can be used as sealing surfaces. Sealing the backhoe frame to the RCS entails welding metal plates across the interior and exterior of the frame at various locations. The internal boot frame is presented in Figure 2 as gray plates. The external boot frame is presented in Figure 3.

Because of the safety significant nature of the backhoe internal and external boot assemblies, installation and fabrication of the boot will be performed by a Nuclear Quality Assurance-1 (NQA-1)-1997 certified subcontractor. Western States will perform all modifications to the backhoe to facilitate installation of the internal and external boot by the NQA-1 subcontractor. Following receipt of the booted backhoe from the NQA-1 subcontractor, Western States shall reinstall specified equipment and restore hydraulic functionality of the backhoe and end effectors. This specification pertains to the preparations necessary for internal and external boot installation, which include equipment relocation, equipment removal, and the retained hydraulic function necessary to facilitate boot installation. Additionally, this specification incorporates the necessary preparations to facilitate field use of the booted backhoe.

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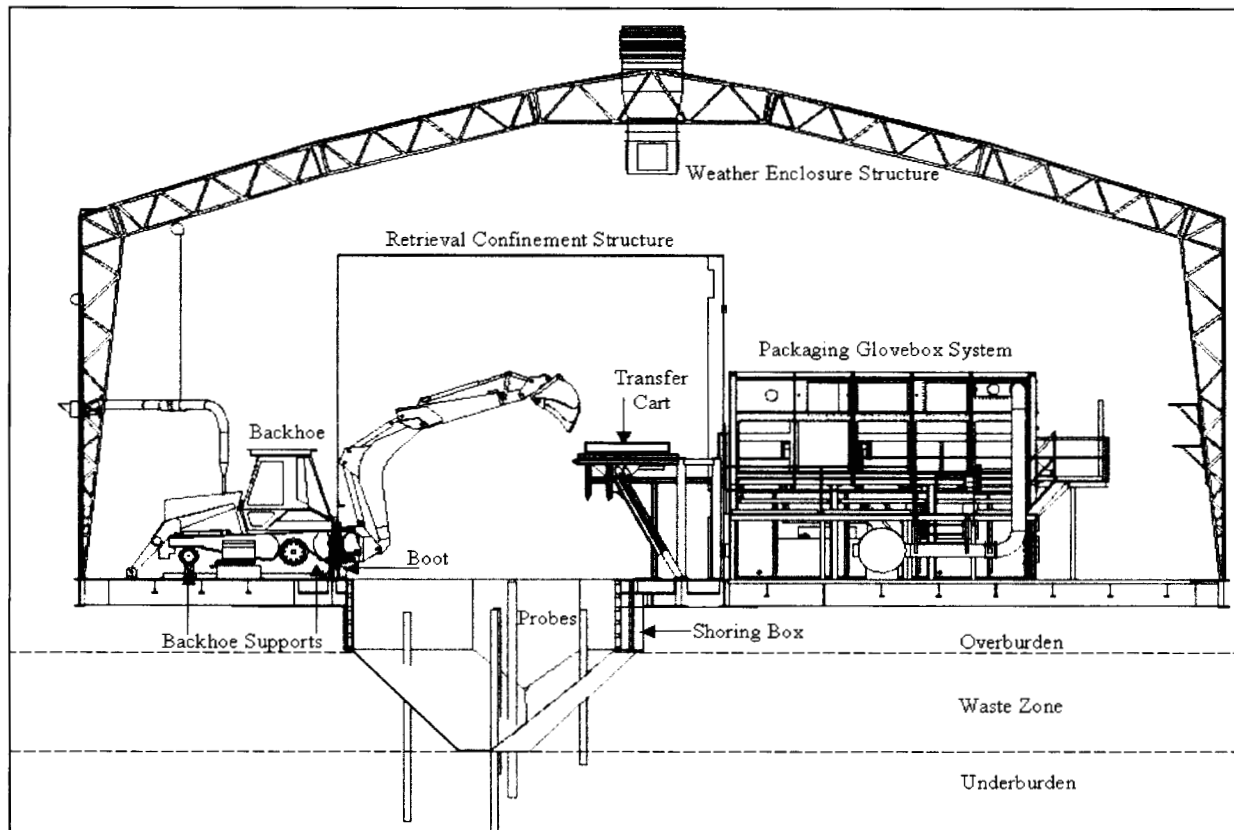


Figure 1. Cross section of the Glovebox Excavator Method Project facility.

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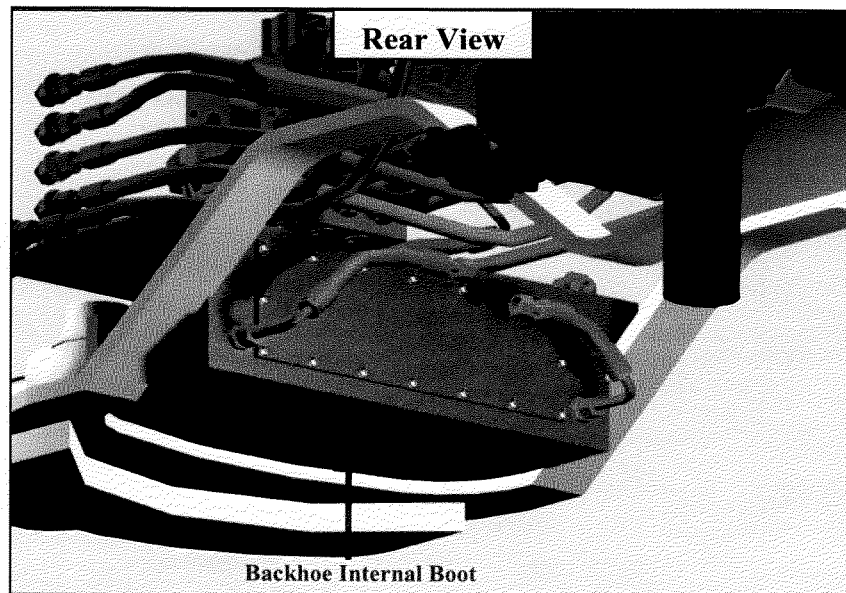


Figure 2. Backhoe internal boot.

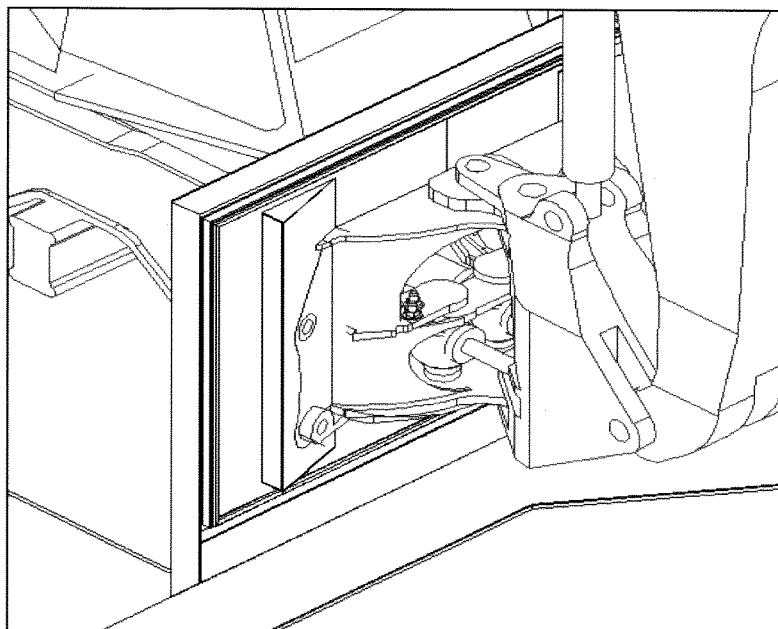


Figure 3. Backhoe external boot.

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## 1.1.1 Preparation for Boot Installation

### 1.1.1.1 Equipment Relocation

Installation of the backhoe internal boot forces permanent relocation of the following parts:

- The brake accumulator: pressurized Nitrogen bottle providing a pressure reservoir for the break hydraulics.
- The hydraulic filter: thread-on type filter used in filtering all backhoe and loader hydraulic fluid prior to reentering the hydraulic tank.

### 1.1.1.2 Hydraulic Filter Relocation

The hydraulic filter is located to the side of the backhoe valve body near the left outrigger frame penetration. The filter is strapped to the backhoe internal frame with hard and flexible lines leading to and from the unit. This filter shall be removed and mounted to the exterior of the backhoe frame near the backhoe's left rear wheel well as shown on drawing 519931. Hydraulic fluid-sampling taps (also located outside the backhoe frame) shall be integrated into the lines leading to and from the relocated filter as shown on drawing 519931.

### 1.1.1.3 Brake Accumulator Relocation

The brake accumulator is located directly across from the hydraulic filter to the opposite side of the backhoe valve body near the right outrigger frame penetration. As with the filter, the accumulator is strapped to the backhoe internal frame with hard and flexible lines leading to and from the unit. The brake accumulator shall be removed and mounted to the inside of the backhoe frame near the backhoe's right rear wheel well as shown on drawing 519931.

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#### 1.1.1.4 Equipment Removal

Installation of the backhoe internal and external boot requires temporary removal of the following equipment as shown on Contractor drawing 519932:

- A. The backhoe boom, stick, extendible stick, and bucket
- B. The backhoe swing cylinder assemblies
- C. The backhoe valve body
- D. The hydraulic lines leading to and from:
  - (1) The backhoe valve body out to the boom, stick, and bucket
  - (2) The stabilizer valve body out to the swing cylinders, extendible stick, and auxiliary connections
  - (3) The stabilizer valve body out to the right and left stabilizers
  - (4) The solenoid valve leading out to the remote hydraulic coupler
- E. Backhoe horn
- F. The right and left stabilizers and associated hydraulic cylinders

#### 1.1.1.5 Retained Hydraulic Function

Following the relocation and removal of the previously mentioned equipment, the backhoe will be shipped, via truck, to the NQA-1-1997 certified subcontractor (selected by the Contractor). In an effort to enhance mobility of the prepared backhoe, hydraulic functionality of the brakes, steering, and loader bucket controls shall remain in tact.

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## 1.1.2 Preparations for Field Use (Following Boot Installation)

### 1.1.2.1 Equipment Reinstallation

Following installation of the backhoe internal and external boot, all of the equipment removed in section 1.1.1.2, are reinstalled onto the backhoe, with the exception of the backhoe horn, right and left stabilizers (including the feet, arms, and cylinders), and the hydraulic lines leading from the stabilizer valve body out to the right and left stabilizers.

Hydraulic lines leading from the stabilizer and backhoe valve bodies through the internal backhoe boot and out to the backhoe boom, stick, bucket, extendible stick, hydraulic coupler, auxiliary, and swing cylinders will require an alternate configuration as shown on drawing 519931.

## 1.2 Work Included

This specification covers Western States requirements for backhoe preparation to facilitate installation of the internal and external boot by the NQA-1 subcontractor. This specification covers Western States requirements for fabrication, assembly, installation, and testing of the backhoe hydraulic fluid-sampling tap. Additionally, this specification covers the reinstallation of equipment removed to facilitate boot installation and the rerouting of hydraulic lines leading from the backhoe valve group, stabilizer valve group, and hydraulic coupler valve. It is not the intent of this specification to completely define all details of relocation and removal of equipment on the 446 B backhoe. Equipment shall be designed, fabricated, assembled, installed, relocated, and removed in accordance with this specification and the equipment supplier and subcontractor's standard practices when such practices do not conflict with this specification.

The following shall be delivered to the specified NQA-1-1997 certified subcontractor:

- A complete and fully integrated hydraulic filter mounted to the exterior of the backhoe near the left rear wheel well in accordance with Drawing 519931.

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- A complete and fully integrated hydraulic fluid-sampling tap mounted to the exterior of the backhoe frame prior to and after the hydraulic filter in accordance with drawing 519931.
- A complete and fully integrated brake accumulator mounted to the interior of the backhoe frame near the right rear wheel well in accordance with drawing 519931.
- A 446B backhoe with the boom, stick, extendible stick, bucket, boom swing cylinder assemblies, backhoe valve body, and all associated hydraulic lines removed to facilitate internal boot installation by the NQA-1 certified subcontractor.
- The afore mentioned backhoe with the right stabilizer assembly, left stabilizer assembly, and all associated hydraulic lines removed to facilitate external boot installation by an NQA-1 certified subcontractor.
- The previously mentioned backhoe with the hydraulic functionality of the brakes, steering, and loader bucket controls in tact.

The following shall be delivered to Bechtel BWXT Idaho, LLC after installation of the internal and external boot assemblies:

- A complete hydraulic fluid sampling kit.
- A booted 446B backhoe with the boom, stick, extendible stick, bucket, boom swing cylinder assemblies, and backhoe valve body reinstalled.
- The afore mentioned backhoe with all hydraulic lines associated with the boom, stick, bucket, swing cylinders, extendable stick, auxiliary, and hydraulic coupler reinstalled as shown on drawing 519931.
- Vendor Data Submittals in accordance with Vendor Data Schedule and this specification.

### 1.3 Work Not Included

Equipment, unless specified herein, is not included. The following items shall not be included in the scope of work of the subcontractor.

- The subcontractor is not responsible for the fabrication and installation of the backhoe internal and external boot assemblies.

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#### **1.4 INEEL–Furnished Materials, Equipment, and Services**

The INEEL will furnish the 446B backhoe loader.

## **2. APPLICABLE CODES, PROCEDURES, AND REFERENCES**

The following documents form a part of this specification to the extent specified herein and as applicable. Unless otherwise specified, the issue in effect on the date of invitation to bid shall apply. In case of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement.

### **2.1 National and Local Codes**

Occupational Safety and Health Administration (OSHA)

OSHA 29 CFR, Part 1910 Occupational Safety and Health Standards

OSHA 29 CFR, Part 1926 Construction Safety and Health Electrical  
Regulations

### **2.2 Industry Standards and DOE Orders**

Not applicable.

### **2.3 Military (National) Specification**

Not applicable.

### **2.4 Related Specifications**

Not applicable.

### **2.5 References**

Not applicable.

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### 3. TECHNICAL REQUIREMENTS

#### 3.1 General

This section defines the design requirements for specific equipment relocation, the hydraulic fluid tap installation, specific equipment removal, and retained hydraulic functionality in an effort to prepare the 446B backhoe for internal and external boot installation by the NQA-1 certified subcontractor. Additionally, this section defines the design requirements for specific equipment reinstallation and rerouting of hydraulic lines in an effort to prepare the booted 446B backhoe for field use.

##### 3.1.1 Preparations for Boot Installation

##### 3.1.1.1 Equipment Relocation

##### 3.1.1.1.1 Hydraulic Filter

The relocated filter shall be the same thread-on type hydraulic filter used within the standard backhoe hydraulic system.

The hydraulic filter shall be located outside of the backhoe body near the backhoe operator's left wheel well as shown on drawing 519931.

##### 3.1.1.1.2 Brake Accumulator

The brake accumulator shall be located within the backhoe body frame near the backhoe operators' right hand wheel well as shown on drawing 519931.

##### 3.1.1.2 Hydraulic Fluid Tap

The design requirements for the hydraulic fluid tap are listed below:

- A hydraulic fluid-sampling tap, located outside the backhoe frame, shall be integrated into the line leading to and from the relocated filter as shown on drawing 519931.

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- The hydraulic fluid tap and sampling kit shall provide a fully functional system and perform as specified in a safe and efficient manner.

### 3.1.1.3 Equipment Removal

#### 3.1.1.3.1 Backhoe Boom Removal

The entire backhoe boom assembly, including the boom, stick, bucket, remote coupler, and all associated hydraulic lines and cylinder connections, shall be removed to provide access for installation of the internal boot assembly.

#### 3.1.1.3.2 Backhoe Boom Swing Cylinder Assembly Removal

The right and left boom swing cylinder assemblies, including all associated hydraulic lines and cylinder connections, shall be removed to provide access for installation of the internal boot assembly.

The boom swing cylinder-bearing support bracket shall be removed to provide access for installation of the internal boot assembly.

#### 3.1.1.3.3 Backhoe Valve Body Removal

The backhoe valve body, including all associated linkage and hydraulic lines, shall be removed to provide access for installation of the internal boot assembly.

#### 3.1.1.3.4 Hydraulic Line Removal

Hydraulic lines leading to and from the backhoe and stabilizer valve bodies shall be removed to provide access for installation of the internal boot assembly as shown on drawing 519932. These lines include:

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- a. Backhoe stick cylinder supply and return lines.
- b. Backhoe bucket cylinder supply and return lines.
- c. Backhoe boom cylinder supply and return lines.
- d. Jaw Bucket cylinder supply and return lines.
- e. Backhoe swing cylinders supply and return lines.
- f. Right hand stabilizer cylinder supply and return lines.
- g. Left hand stabilizer cylinder supply and return lines.
- h. Backhoe extendible stick cylinder supply and return lines.

Additionally, the hydraulic line leading from the remote hydraulic coupler solenoid valve out to the coupler shall be removed to provide access for installation of the internal boot assembly.

#### 3.1.1.3.5 Backhoe Horn Removal

The backhoe horn assembly, located within the frame structure between the backhoe valve body and the boom, shall be permanently removed to provide access for installation of the internal boot assembly.

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#### 3.1.1.3.6 Right and Left Stabilizer Removal

Both the right and left stabilizer assemblies, including all hydraulic cylinder connections and hydraulic lines, shall be permanently removed to provide access for installation of the external boot assembly.

#### 3.1.1.4 Retained Hydraulic Functionality

In an effort to enhance mobility of the prepared backhoe, hydraulic functionality of the brakes, steering, and loader bucket controls shall remain in tact prior to shipment of the backhoe to the NQA-1 certified subcontractor. Hydraulic line capping and rerouting shall not inhibit functionality of the brakes, steering, and loader bucket controls.

### 3.1.2 Preparations for Field Use

#### 3.1.2.1 Equipment Reinstallation

Following installation of the backhoe internal and external boot, all of the equipment removed in section 1.1.1.2 are reinstalled onto the backhoe with the exception of the backhoe horn, right and left stabilizers, and the hydraulic lines leading from the stabilizer valve body out to the right and left stabilizers.

Hydraulic lines leading from the stabilizer and backhoe valve bodies through the internal backhoe boot and out to the backhoe boom, stick, bucket, extendible stick, hydraulic coupler, auxiliary, and swing cylinders will require an alternate configuration as shown on drawing 519931.

### 3.2 Restrictions

None identified.

### 3.3 Performance Requirements

The hydraulic fluid tap and kit shall be capable of retrieving a volumetric sample of the hydraulic fluid without loss of sample or leakage of installed tap.

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The modified backhoe shall retain full hydraulic function of the brakes, steering, and loader bucket prior to shipment to the NQA-1 certified subcontractor.

The booted backhoe shall be capable of full hydraulic function (excluding the stabilizers) prior to shipment to the contractor.

### **3.4 Software**

Not applicable.

### **3.5 Registered Professional Engineer Certification**

Not applicable.

### **3.6 Human Factors**

The design shall use human factor engineering principles and criteria such that the hydraulic filter, brake accumulator, and hydraulic fluid tap are easily maintainable. The design shall provide access to these system components (located outside of the RCS) for operation, cleaning, and maintenance.

### **3.7 Reliability and Maintainability**

#### **3.7.1 Reliability**

All subcomponents of the hydraulic filter, hydraulic fluid sampling tap/kit, and relocated brake accumulator shall be of a quality that the expected mean time between failure for this system shall not be less than 1,080 hours.

The hydraulic filter and brake accumulator mounting systems shall employ rugged, industrial, off-the-shelf equipment to the maximum extent practical.

The hydraulic fluid tap and sampling kit shall employ rugged, industrial, off-the-shelf equipment to the maximum extent practical.

#### **3.7.2 Maintainability**

The filter, accumulator, and sample tap shall be designed and assembled to facilitate ease of inspecting, servicing, and maintaining equipment.

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The hydraulic filter and sampling kit standard replacement parts, shown on manufacturer's recommendations, shall be readily available for routine maintenance activities.

**3.8 Environmental Regulatory Requirements and/or Site and Operating Requirements**

Not applicable.

**3.9 Natural Phenomena Requirements**

Not applicable.

**4. ENVIRONMENTAL, SAFETY, AND HEALTH REQUIREMENTS**

**4.1 Subcontractor Safety**

The subcontractor shall work in accordance with applicable OSHA requirements as stated in 29 CFR 1910.

**4.2 Personal Protective Equipment**

The subcontractor shall determine and require use of appropriate personal protective equipment for all tasks performed.

**4.3 Emergency Response**

Not applicable.

**4.4 Accident Investigation**

Not applicable.

**5. MANUFACTURING AND ASSEMBLY**

**5.1 General**

The hydraulic filter and brake accumulator devices shall be removed and reinstalled onto a 446B backhoe, in the subcontractor's shop, to ensure proper fits and operation.

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The hydraulic fluid sampling taps shall be installed into the hydraulic lines leading to and from the hydraulic filter, in the subcontractor's shop, to ensure proper fits and operation.

The boom assembly, boom pivot cylinders, boom pivot cylinder bearing support, specified hydraulic lines, backhoe valve body group, horn, and stabilizers shall be removed from the backhoe in the subcontractor's shop.

Rerouting and capping of hydraulic lines shall be performed in the subcontractor's shop to facilitate full hydraulic function of the backhoe brakes, steering, and loader prior to shipment to the NQA-1-certified subcontractor.

The boom assembly, boom pivot cylinders, boom pivot cylinder bearing support, specified hydraulic lines, and backhoe valve body group shall be reinstalled onto the backhoe in the subcontractor's shop.

The contractor's technical representative or alternate will inspect the assembled final product. Assembly and disassembly of the equipment shall be made in a clean dust-free area of the subcontractor's facility.

## **5.2 Prohibitions**

None identified.

## **5.3 Material**

Materials used shall be free from defects that would adversely affect the performance or maintainability of individual components or the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in Caterpillar's standard commercial practice.

## **5.4 Fabrication**

A manufacturing/inspection/test plan shall be submitted to the contractor before shipment to the NQA-1 subcontractor. The plan shall detail the fabrication, assembly, installation, inspection, examination, and/or test process to be performed. The plan shall be submitted for approval prior to subcontractor initiation of any manufacturing, inspection, or test activities for incorporation of contractor source inspection hold points.

## **5.5 Equipment Tagging**

Not applicable.

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## **5.6 Cleaning, Painting, and Coating**

Not applicable.

## **5.7 Spare Parts**

Applicable standard quality requirements identified in the procurement package shall be cross-referenced.

## **5.8 Other Processes**

Not applicable.

# **6. SUBMITTALS**

As a minimum, the subcontractor shall provide the contractor with the submittals referenced in this section. The subcontractor shall be responsible for all submittals that come from the equipment supplier. Additional submittal requirements are defined in the vendor data schedule and applicable contract documents. The quantities and submittal schedule is included in the attached vendor data schedule.

## **6.1 General Submittal Requirements**

### **6.1.1 General Procedures**

Vendor data, whether prepared by the subcontractor or subcontractor's subtier or supplier, shall be submitted as instruments of the subcontractor. Therefore, prior to submittal, the subcontractor shall ascertain that material and equipment covered by the submittal and the contents of the submittal itself meet all the requirements of the subcontract specifications, drawings, or other contract documents.

Each submittal shall contain identification for each separable and separate piece of material or equipment and literature with respect to the information provided in the specification and on the vendor data schedule. Submittals shall be numbered consecutively for each different submittal.

### **6.1.2 Vendor Data Schedule**

Vendor data required by the specification sections are identified on the vendor data schedule. The vendor data schedule provides a tabular listing by item number, a drawing or specification reference, and a description

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of the item or service. The type of submittal is identified by a “Vendor Data” code, and the time required to submit the item is identified by a “When to Submit” code. An “Approval” code specifies whether the submittal is for mandatory approval or for information only. One copy of routine paper or electronic file submittals is required; additional copies may be required by the vendor data schedule. Electronic file submittals are preferred.

#### 6.1.3 Vendor Data Transmittal and Disposition Form 431.13

All vendor data shall be submitted to the contractor using the Vendor Data Transmittal and Disposition Form. The form provides the subcontractor a method to submit vendor data and provides the contractor a means of dispositioning the submittal. The subcontractor shall list the vendor data schedule item number, a vendor data transmittal tracking number (if applicable), the drawing or specification number reference, a tag number (if applicable), the submittal status (e.g., mandatory approval, information only, or re-submittal), the revision level, and the item description. The description should be complete enough that a person unfamiliar with the project can determine what the submittal includes.

#### 6.1.4 Disposition by the Contractor

The contractor’s comments and required action by the subcontractor will be indicated by a disposition code on the submittal.

The disposition codes will be classed as follows:

- A. **Work May Proceed:** Submittals so noted will generally be classed as data that appears to be satisfactory without corrections.
- B. **Work May Proceed with Comments Incorporated. Revise Affected Sections and Resubmit Entire Submittal:** This category will cover data that, with the correction of comments noted or marked on the submittal, appears to be satisfactory and requires no further review by the contractor prior to construction.
- C. **Work May NOT Proceed. Revise and Resubmit:** Submittals so dispositioned will require a corrected re-submittal for one of the following reasons:

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- (1) Submittal requires corrections, shown on comments, prior to final review.
- (2) Submittal data incomplete and requires more detailed information prior to final review.
- (3) Submittal data does not meet subcontract document requirements.

D. **Accepted for Use. Information Only Submittal:** Submittals so dispositioned will generally be classified as information only for as-specified material and equipment.

Mandatory approval-coded vendor data will be reviewed by the contractor and receive an A, B, or C disposition. Information only submittals without comments will receive a D disposition. The A, B, and C-coded dispositioned submittals will be returned to the subcontractor. The D-dispositioned submittals will not be returned to the subcontractor. The contractor may provide internal review of information only submittals. In the event that comments are generated on an information only submittal, the submittal may be dispositioned B or C and returned to the subcontractor for appropriate action. Acknowledgment of receipt of dispositioned vendor data by the subcontractor will not be required.

The contractor will return dispositioned submittals with reasonable promptness. The subcontractor shall note that a prompt review is dependent on timely and complete submittals in strict accordance with these instructions.

## 6.2 Spare Parts and Special Tools List

The subcontractor shall submit to the contractor a list of recommended spare parts and any special tools required for operation and maintenance of the hydraulic filter, hydraulic fluid tap, hydraulic fluid sampling kit, and brake accumulator. This list shall include all corresponding suppliers of each component and their phone numbers.

## 6.3 Operations and Maintenance Manuals

The backhoe standard operations and maintenance manual shall be supplied to the subcontractor.

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#### **6.4 Drawings**

Not applicable.

#### **6.5 Software**

Not applicable.

#### **6.6 Inspection Test Plans/Procedures/Reports**

Inspection of these documents includes the following:

- Performance test procedures (to be conducted before subcontractor shipment to NQA-1 certified subcontractor): Performance test plans, procedures, and reports as outlined in section 7.4.1 of this specification.
- Performance test reports (to be conducted before subcontractor shipment to NQA-1 certified subcontractor): Performance test results and reports as outlined in section 7.4.2 of this specification.

### **7. QUALITY ASSURANCE**

#### **7.1 Minimum Qualifications of Subcontractor**

The minimum qualifications of the subcontractor are listed below:

- The brake accumulator, hydraulic filter, and hydraulic fluid sampling tap shall be relocated, assembled, and installed by a firm that has prior related experience pertaining to rerouting of backhoe hydraulic lines and installation of hydraulic fluid sampling taps.
- A firm having prior related experience pertaining to rerouting of backhoe hydraulic lines and disassembly/assembly of a 446B backhoe shall perform all backhoe disassembly and assembly activities.
- A firm having prior related experience pertaining to rerouting and capping of hydraulic lines on a 446B backhoe shall perform all hydraulic line modifications to ensure functionality of the brakes, steering, and loader bucket prior to shipment to the NQA-1 1977 certified subcontractor.
- A firm having prior related experience pertaining to rerouting and capping of hydraulic lines on a 446B backhoe shall perform all hydraulic line modifications to ensure functionality of the boom, stick, bucket,

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extendible stick, hydraulic coupler, auxiliary, and swing cylinder bucket prior to shipment to the contractor.

## 7.2 QA Program

The manufacturer is responsible for providing materials and workmanship that meet the codes and standards identified in this specification.

## 7.3 Nondestructive Examination

Not applicable.

## 7.4 Operational Testing

### 7.4.1 Performance Test Procedures (To Be Conducted before Subcontractor Shipment to NQA-1 Certified Subcontractor)

The equipment supplier or subcontractor shall submit to the contractor an “in-shop” testing plan and procedure prior to demonstration of the hydraulic fluid sampling capabilities, conformation of internal frame accessibility, and the specified hydraulic functionality at the subcontractor’s facility. The plan and procedure shall include the date, test conditions, duration of testing, testing sequence, materials used, and methods of performing the tests.

The subcontractor shall inform the contractor one week in advance of performance testing so a contractor representative may be present during the testing process.

Subcontractor testing should demonstrate that all equipment operates and interfaces together into a functional system as defined within this specification.

Testing acceptance includes the following criteria:

- Confirm hydraulic fluid sampling capabilities.
- Confirm accessibility of the backhoe internal frame within the vicinity of the internal boot assembly prior to shipment to an NQA-1 certified subcontractor.
- Confirm hydraulic functionality of brakes, steering, and loader bucket prior to shipment to an NQA-1 certified subcontractor.

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- Following reinstallation of the boom assembly, boom pivot cylinders, boom pivot cylinder bearing support, specified hydraulic lines, and backhoe valve body group on the booted backhoe, test all hydraulic functions of the backhoe.

7.4.2 Performance Test Report (To Be Conducted before Subcontractor Shipment to Nuclear Quality Assurance-1 Certified Subcontractor)

The equipment supplier or subcontractor shall submit to the contractor the “in-shop” testing results following demonstration of the acceptance criteria.

**7.5 Special Processes**

Not applicable.

**8. PACKAGING AND SHIPPING**

**8.1 Packing and Packaging**

The subcontractor shall prepare the 446B backhoe for shipping. As a minimum, the backhoe shall be securely anchored during transport, and the backhoe boom (if present) shall be locked in the upright position and secured.

**8.2 Marking and Handling**

Not applicable.

**8.3 Special Transportation Requirements**

Transportation shall be via truck; rail transportation is not allowed. The subcontractor shall be responsible for dimensional stability and overall integrity of the equipment during shipment.

**9. INSTALLATION AND MAINTENANCE**

**9.1 Installation**

See drawing 519931 for locations of filter, sampling tap, and accumulator.

See drawing 519931 for reinstallation and rerouting of hydraulic lines leading from the stabilizer valve group, backhoe valve group, and hydraulic coupler solenoid valve to the backhoe internal boot.

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See drawing 519932 for disconnection of appropriate hydraulic lines prior to shipping the backhoe to the NQA-1 certified subcontractor.

## **9.2 Startup and Calibration**

Not applicable.

## **9.3 Training**

**NOTE:** *It is anticipated that the hydraulic fluid sampling device will be simple enough that formal training above the instructions provided with the tool will not be required.*

Any required training above the instructions provided with the hydraulic fluid sampling kit shall be provided initially by the subcontractor to an INEEL representative who will then provide training to other INEEL personnel that require training.

## **9.4 Maintenance**

Not applicable.

# **10. MARKING AND IDENTIFICATIONS**

Not applicable.

# **11. ACCEPTANCE**

## **11.1 Final Acceptance Method**

Successful performance of the test results and submittal of all documents listed on the vendor data schedule will constitute acceptance.

## **11.2 Inspection and Hold Points**

The contractor shall determine inspection and hold points after review of the manufacturing/inspection/test plan.

Unless otherwise specified by the purchase order, the supplier shall notify the contractor at least five working days in advance of the time that the item(s) will be available for source inspection by the contractor representative. Work cannot proceed without written authorization from the contractor after hold point inspection.

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### **11.3 INEEL Surveillance and Audits**

The authorized contractor representative may perform source inspection or surveillance.

## **12. ATTACHMENTS**

Vendor Data Schedule- form 431.14

Contractor drawing 519931

Contractor drawing 519932

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## ATTACHMENT A

431.14  
08/01/2001  
Rev. 03

## Vendor Data Schedule

**Project Title** OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT - BACKHOE  
MODIFICATION - PREPARATION FOR BOOT INSTALLATION AND PREPARATION  
FOR FIELD USE

**Project No.** 021052 -  
22011

**System Engineer/ Project Manager** LOPEZ DARYL A

**Date:** 12-APR-02

**Rev:** 0

**Vendor Data Coordinator Address** STURM BETH L, WCB-3WH502, MS: 3535

Vendor Data Codes				
A. As-Built Drawings B. Assembly Drawings C. Attendance Record D. Blasting Plan E. Catalog Data F. Chem & Physical Analysis G. Concrete Mix Design H. Control System Diagram I. Design Calculations J. Installation Instructions	K. Manufacturers Data Report L. O&M Manual M. Parts List N. Piping Drawing O. Procedure/Instructions P. Pump Head Curves Q. Personnel Qualifications R. Red_line Drawings S. RSMI & Maintenance Log T. Sample(Color, Texture, etc.)	U. Shop Drawings V. Survey Records W. Test Procedure X. Special Processes Y. Operational/CC Testing Z. Test Reports AA. UL/FM Listing AB. Warranty/Guarantee AC. Weld Records AD. Wiring Diagrams	AE. MSDS AF. Hardware Schedule AG. Specification AH. Manufacturing/Inspection/Test Plan AI. Test Certification AJ. Recommended Spares AK. Special Tools List AL. Certificate of Conformance AM. Certificate of Disposal or Destruction AN. Design Verification	AO. Design Qualification Testing AP. Traceability Procedure AQ. Cleaning Procedure AR. Weld Procedure Qualificaiton AS. Welder Performance Personnel Qualifications AT. Non-Destructive Examination Personnel Certifications AU. Inspector Certifications AV. Limited Shelf Life/Operational Data AW. Special Packaging, Shipping, and Rigging Procedure AX. Certificate of Materials to ASME Code AY. Chemical Inventory AZ. Other
When to Submit				
AC - As Completed AT - After Test BC - Before Contract Awarded	BFA - Before Final Acceptance BFR - Before Fabrication Release ROS - Removed Off-Site PDS - Prior to Delivery	PTP - Prior to Purchase PS - Prior to Shipment PT - Prior to Test	PTC - Prior to Construction Start PTI - Prior to Installation PTW - Prior to Welding	TS - Time of Shipment WP - With Proposal

Specification	<b>BACKHOE MODIFICATIONS – PREPARATION FOR BOOT INSTALLATION AND FIELD USE FOR THE OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT</b>	Identifier: SPC-401 Revision: 0 Page: A2 of A2
Environmental Restoration		

### ATTACHMENT A

	on site					
Item No.	Clause/Article or Drawing/Specification Reference	Description	Vendor Data Code	Extra Copies Required	When to Submit	Approval Code
	7.4.1		W. Test Procedure	4	PT - Prior to Test	Approval Required
	7.4.2		Z. Test Reports	4	AT - After Test	Approval Required
	6.2		AK. Special Tools List	4	PS - Prior to Shipment	Information Only
	6.3		L. O&M Manual	4	PS - Prior to Shipment	Information Only
	6.2		AJ. Recommended Spares	4	PS - Prior to Shipment	Information Only
	5.4		AH. Manufacturing/Inspection/Test Plan	4	BFR - Before Fabrication Release	1. Approval Required

Instructions: 1. Refer to subcontract documents for instructions on submittals.  
2. Electronic submittals in lieu of paper documents are acceptable and encouraged.  
3. The normal number of copies required is ONE. If more are required, the number will be shown here.  
4. THE INEEL WILL SCAN ALL SUBMITTED VENDOR DATA INTO A SYSTEM THAT IS ACCESSIBLE TO ALL INEEL EMPLOYEES UNLESS THE SUPPLIER/SUBCONTRACTOR IDENTIFIES SUBMITTED INFORMATION AS PROPRIETARY.



NOTES:

1. FLOW/CYCLE TIME OF THE BACKHOE VALVE GROUP TO BE CHANGED TO THE FOLLOWING BY INSTALLING ORIFICE CHOKES IN ITEM 80:  

STICK CYLINDER	— 14.5 TO 15.5 GPM, 10 TO 10.5 SEC CYCLE STOP TO STOP.
BOOM CYLINDER	— 11.5 TO 12.5 GPM, 5 TO 5.5 SEC CYCLE CYCLE TO SNUBBER.
BUCKET CYLINDER	— 16.25 TO 17.25 GPM, 2.5 TO 3.5 SEC CYCLE STOP TO STOP BUCKET DUMP.
2. FLOW/CYCLE TIME OF THE STABILIZER VALVE GROUP TO BE CHANGED TO THE FOLLOWING:  

SWING VALVE	— 8.5 TO 9.5 GPM, 7 TO 7.5 SEC. CYCLE STOP TO SNUBBER.
AUXILIARY VALVE	— 14.5 TO 15 GPM.

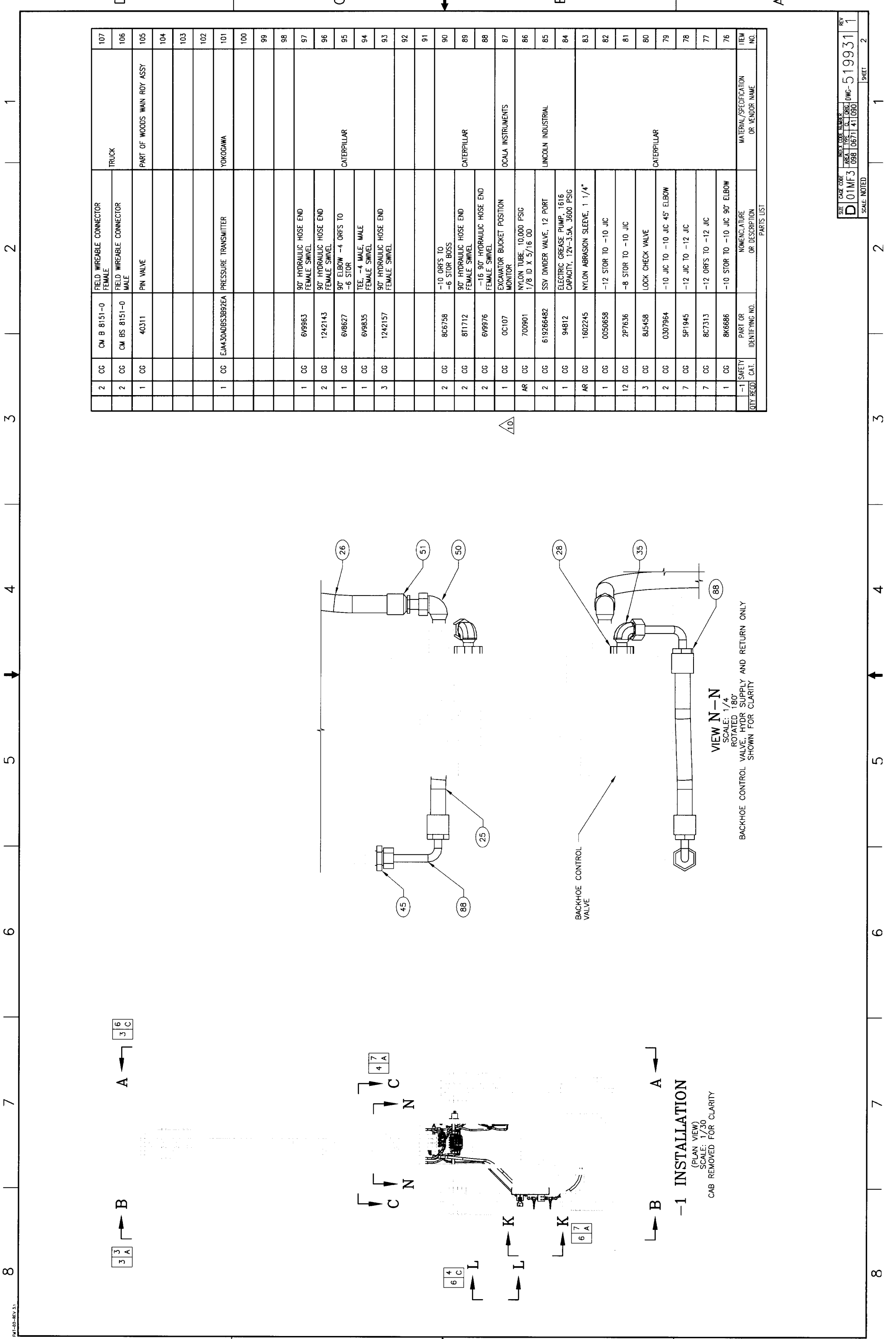
3	CG	8C7312	-10 ORFS TO -10 JIC SWIVEL		75
2	CG	6V9012	-8 JIC TO -10 JIC	CATERPILLAR	74
2	CG	8C7311	-8 ORFS TO -8 JIC FITTING		73
1	CG	QPSX34-SAE-3/4-H-H	MALE COUPLER		72
1	CG	QPSX34-SAE-3/4-F-H	FEMALE COUPLER	HOLMBURY	71
4	CG	Q308190	-10 JIC TO -12 STOR		70
2	CG	1P7625	90° ELBOW, -8 STOR TO 37° -10 JIC	CATERPILLAR	69
4	CG	2P7636	-8 STOR TO -10 37° JIC		68
1	CG	10-6 CTX	90° ELBOW, 3/8 NPT TO -8 JIC	PARKER	67
3	CG	0618248	MALE TO MALE JIC CONNECTOR	CATERPILLAR	66
28	CG	9508	5/8 TFE HYDRAULIC HOSE 4000 PSIG WORKING PRESSURE	PARKER	65
					64
2	CG	6V9510	-11 PLUG		63
2	CG	6V9831	-10 CAP	CATERPILLAR	62
4	CG	8T0404	90° ELBOW, -12 STOR TO -10 ORFS MALE		61
-1	SAFETY	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL / SPECIFICATION OR VENDOR NAME	ITEM NO.
QTY REQD	CAT.				
PARTS LIST					

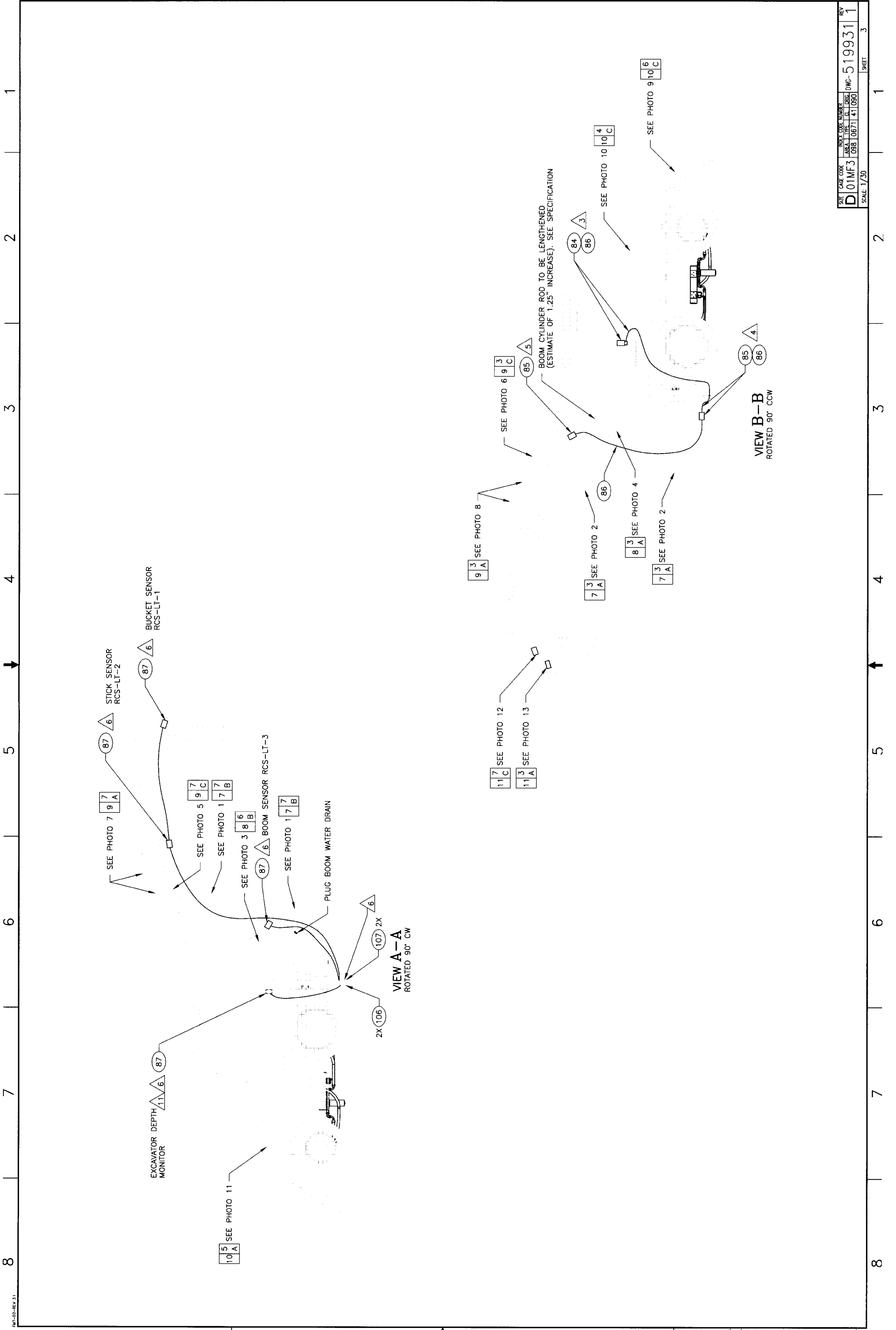
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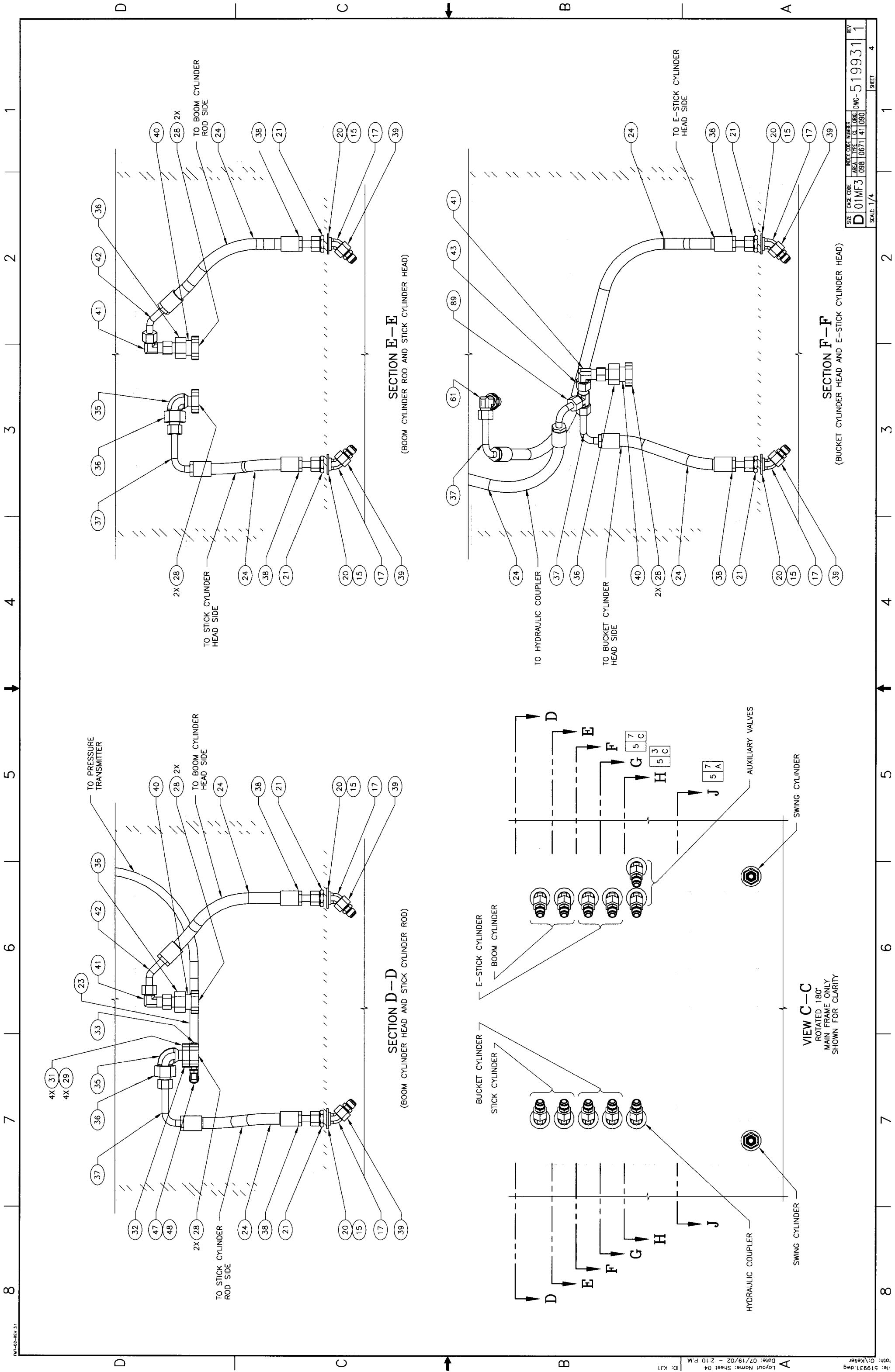
DIMENSIONING AND SYMBOLOGY ARE AMERICAN NATIONAL STANDARD UNLESS OTHERWISE SPECIFIED SURFACE ROUGHNESS 12/		SUBCONTRACT NO.	<div><div><b>INEEL</b> <small>INTEGRATED ENGINEERING &amp; CONSTRUCTION, LLC</small> BECHTEL/BKRT/IDAHO - LLC</div><div>OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT EXCAVATOR MODIFICATIONS WSE (WESTERN STATE EQUIPMENT) MODIFICATIONS</div></div>				
DIMENSIONS AND TOLERANCES ARE IN INCHES TOLERANCES DECIMALS FRACTIONS AND/OR DASH		REQUESTER: S.A. DAVIES DESIGN: B. GROVER DRAWN BY: <i>Jeffrey</i> / RUBBA PROJECT NO.: 021052 SPEC. CODE: FOR REVIEW/APPROVAL SIGNATURES SEE DASH NO. 03345	SIZE <b>D</b> 01MF3 AREA TYPE 098 10671 411090	INSET CODE NUMBER DWG-519931	REV 1		
-1 519933 NEXT ASSY APPLICATION			SCALE: NONE	SHEET 1 OF 11			

[illegible][illegible][illegible]





SIZE	CASE CODE	UNITS	CONF. NUMBER	REV
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DWG-519931				1
SCALE 1/30				SHEET 3







D

C

B

A

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STICK CYLINDER



EXTENDABLE STICK CYLINDER

- 65 2X
- 66
- 67

ROUTE NEW ITEM 65 (5/8" TFE HYDRAULIC HOSE) ON THIS SIDE OF BOOM AND STICK. FABRICATE 2 HOSES FOR COUPLER SYSTEM. FIRST HOSE, ITEM 65, FROM SEAL TO END OF BOOM APPROX. 165 INCHES LONG. SECOND HOSE, ITEM 65, FROM END OF BOOM TO COUPLER APPROX. 203 INCHES LONG. CONNECT HOSE END TOGETHER WITH ITEM 66. CONNECT TO COUPLER CYLINDER USING ITEM 67. ATTACH PER MAIN ROY INSTALLATION RECOMMENDATIONS.

BOOM CYLINDER

BUCKET CYLINDER

- 65 2X
- 68 2X
- 69
- 83

LH SWING CYLINDER HOSE ASSY'S 8Y-8696 (28.7 INCHES LG.) AND 8W-6812 (35 INCHES LG.) TO BE REPLACED WITH ITEM 65 (5/8" TFE HYDRAULIC HOSE). HOSE ASSY 8W-6812 WILL BE ROUTED FROM A BULKHEAD CONNECTOR AT SEAL AND WILL REQUIRE SHORTENING (ESTIMATED LENGTH IS 30 INCHES). FIELD VERIFY LENGTH NEEDED AND PROVIDE NYLON ABRASION SLEEVE PROTECTION (ITEM 83) ON BOTH HOSE ASSY'S. CONNECT NEW HOSES TO HYDRAULIC CYLINDERS USING ITEMS 68 AND 69.

PHOTO 1



- 65 4X
- 66 2X
- 70 2X
- 71
- 72

ROUTE 2 NEW AUXILIARY HYDRAULIC HOSES ITEMS 65 ON THIS SIDE OF BOOM AND STICK. FOLLOW MAIN ROY INSTALLATION RECOMMENDATIONS FOR AUXILIARY HOSE ROUTING ON CLAM BUCKET. CONNECT HOSES TOGETHER (2 HOSES 165" LG. AND 2 HOSES 203" LG.) USING ITEMS 66. INSTALL QUICK DISCONNECT ITEMS 71 AND 72 USING ITEMS 70.

- 65 2X
- 68 2X
- 69
- 83

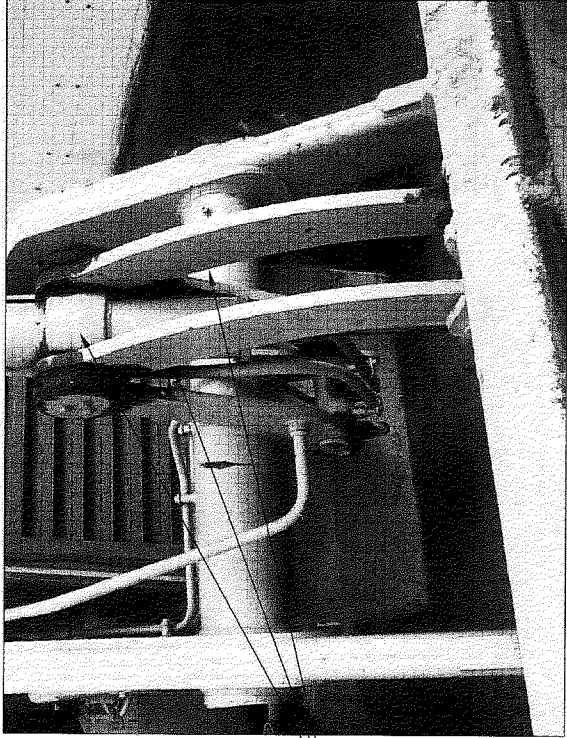
RH SWING CYLINDER HOSE ASSY'S 8Y-8696 (28.7 INCHES LG.) AND 8W-6812 (35 INCHES LG.) TO BE REPLACED WITH ITEM 65 (5/8" TFE HYDRAULIC HOSE). HOSE ASSY 8W-6812 WILL BE ROUTED FROM A BULKHEAD CONNECTOR AT SEAL AND WILL REQUIRE SHORTENING (ESTIMATED LENGTH IS 30 INCHES). FIELD VERIFY LENGTH NEEDED AND PROVIDE NYLON ABRASION SLEEVE PROTECTION (ITEM 83) ON BOTH HOSE ASSY'S. CONNECT NEW HOSES TO HYDRAULIC CYLINDERS USING ITEMS 68 AND 69.

PHOTO 2



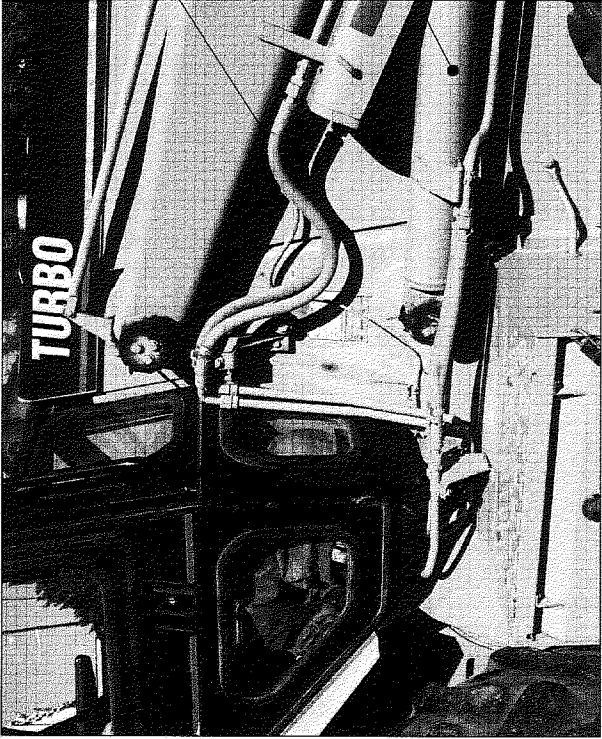
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8 7 6 5 4 3 2 1



REMOVE TILT CYLINDER AND LOADER BUCKET LINKS

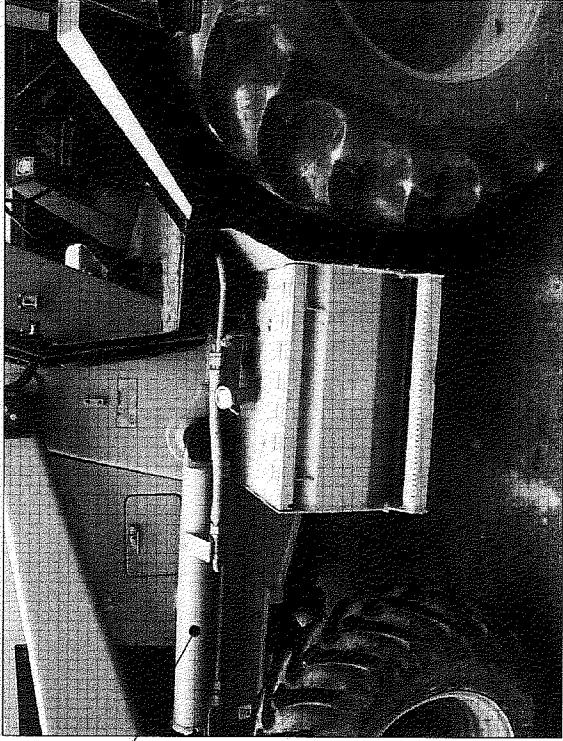
PHOTO 9



DISCONNECT AND CAP TILT CYLINDER SUPPLY AND RETURN LINES TO LOADER VALVE GROUP. REMOVE TILT CYLINDER LINES FROM LIFT GROUP TO LOADER TILT CYLINDERS.

REMOVE LOADER CYLINDERS AND CAP LINES USING ITEMS 62 AND 63. INSTALL ITEM 5 SO THAT LOADER ARM IS 24.0 ABOVE GRADE

PHOTO 10



REMOVE LOADER CYLINDERS AND CAP LINES USING ITEMS 62 AND 63. INSTALL ITEM 5 SO THAT LOADER ARM IS 24.0 ABOVE GRADE

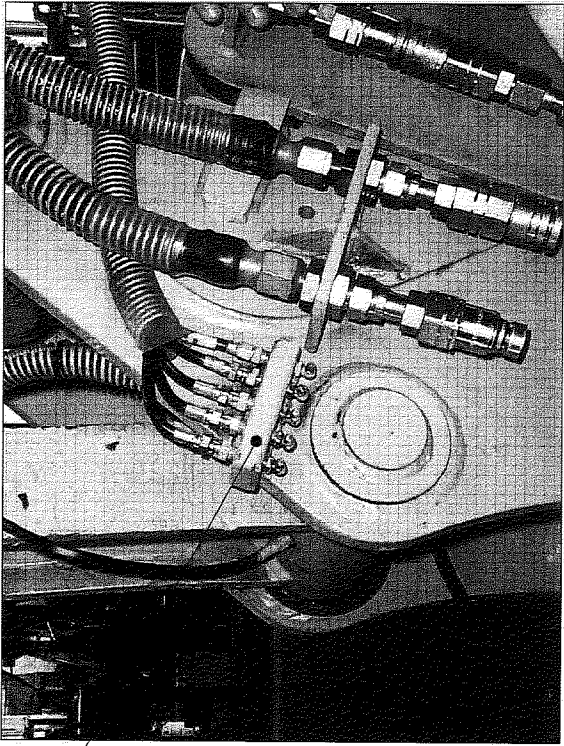
PHOTO 11

D

C

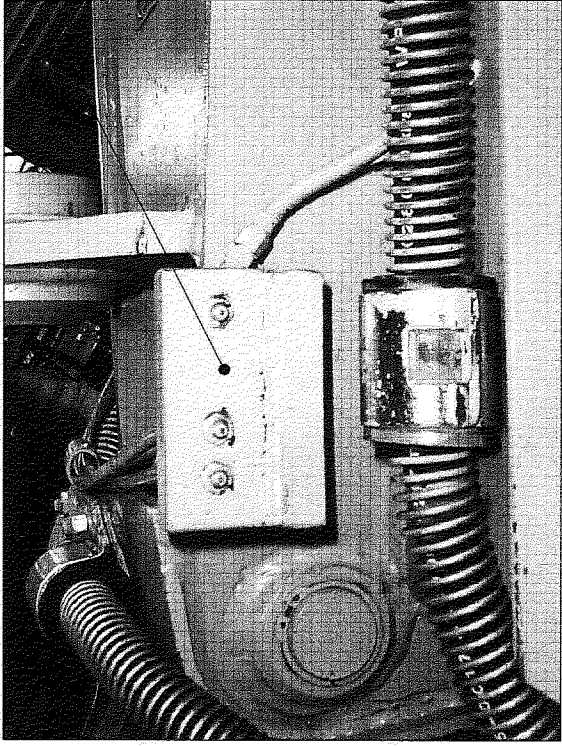
B

A



INSTALL 5 POINT GREASE  
DISTRIBUTION BLOCK FOR  
BUCKET LINKAGE SYSTEM

PHOTO 12



INSTALL 3 POINT GREASE  
DISTRIBUTION BLOCK FOR  
JAW BUCKET LINKAGE SYSTEM

PHOTO 13

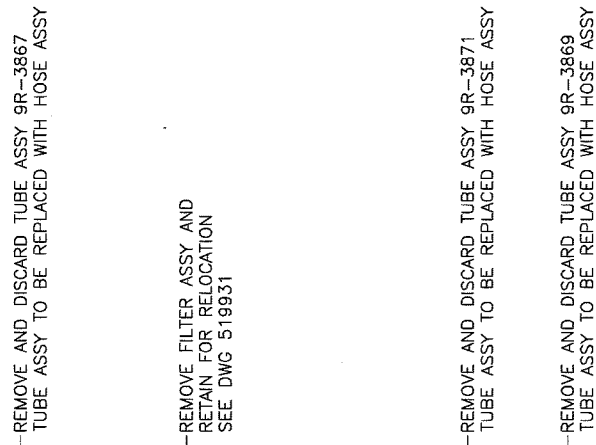
SIZE	CAGE CODE	INSTR CODE	NUMBER	REV
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EFFECTIVE DATE:

5. CATERPILLAR BACKHOE MODEL 446B GFE.

[illegible]



SIZE	CAGE CODE	INDEX CODE NUMBER				DWG--	REV
D	01MF3	AREA	TYPE	CL	ORIG	519932	
		098	0671	41	090		

SCALE: NOTED

SHEET 2